Amendments to the Claims

The following listing of claims replaces all prior versions and listings in the application:

Listing of Claims:

1. (Currently Amended) A dielectric gate comprising one or more electrodes coupled between an inlet fluid pathway and an outlet fluid pathway, and means for driving the one or more electrodes ~~driven by~~ with ~~inhomogeneous~~ AC signals ~~for drawing~~ to draw fluid from the inlet fluid pathway to the outlet fluid pathway using dielectrophoretic forces resulting from inhomogeneous electrical fields, wherein the inlet or outlet fluid pathway comprises hydrophilic or hydrophobic surface coatings configured to provide preferential fluid flow directions.

2. (Original) The gate of claim 1, wherein the inlet fluid pathway comprises a tube or channel.

3. (Original) The gate of claim 1, wherein the outlet fluid pathway comprises a tube or channel.

4. (Canceled)

5. (Canceled)

6. (Original) The gate of claim 1, further comprising a chamber covering at least a portion of the gate.

7. (Original) The gate of claim 1, further comprising a fluidic injector in operative relation to the inlet fluid pathway.

8. (Original) The gate of claim 7, wherein the fluidic injector comprises a hydrophilic or hydrophobic coating.

9. (Currently Amended) A dielectric gate comprising:

an inlet fluid pathway;

one or more electrodes in operative relation with the inlet fluid pathway;

a hydrophobic patch adjacent at least one of the electrodes; ~~and~~

an outlet fluid pathway in operative relation with at least one of the electrodes; and

means for driving the one or more electrodes with AC signals to draw fluid from the inlet fluid pathway to the outlet fluid pathway using dielectrophoretic forces resulting from inhomogeneous electrical fields;

~~wherein the one or more electrodes are driven by inhomogeneous AC signals for drawing fluid from the inlet fluid pathway to the outlet fluid pathway using dielectrophoretic forces; and~~

wherein the hydrophobic patch is configured to inhibit fluid flow from the inlet fluid pathway to the outlet fluid pathway in the absence of the electrical signals.

10. (Original) The gate of claim 9, wherein the inlet fluid pathway comprises a tube or channel.

11. (Original) The gate of claim 9, wherein the outlet fluid pathway comprises a tube or channel.

12. (Original) The gate of claim 9, wherein the inlet fluid pathway comprises hydrophilic or hydrophobic surface coatings defining a virtual channel, which provides preferential fluid flow directions.

13. (Original) The gate of claim 9, wherein the outlet fluid pathway comprises hydrophilic or hydrophobic surface coatings defining a virtual channel, which provides preferential fluid flow directions.

14. (Canceled)

15. (Original) The gate of claim 9, further comprising a chamber covering at least a portion of the gate.

16. (Original) The gate of claim 9, further comprising a fluidic injector in operative relation to the inlet fluid pathway.

17. (Original) The gate of claim 16, wherein the fluidic injector comprises a hydrophilic or hydrophobic coating.

18. (Currently Amended) A system for fluid flow control, comprising:

a dielectric gate including an inlet and outlet fluid pathway;

a fluid reservoir coupled to the inlet fluid pathway of the dielectric gate; ~~and~~

a fluidic device coupled to the outlet fluid pathway of the dielectric gate; and

means for driving one or more electrodes with AC signals to draw fluid from the inlet fluid pathway to the outlet fluid pathway using dielectrophoretic forces resulting from inhomogeneous electrical fields.

~~wherein the dielectric gate comprises one or more electrodes driven by inhomogeneous AC signals for drawing fluid from the fluid reservoir via the inlet fluid pathway to the fluidic device via the outlet fluid pathway using dielectrophoretic forces.~~

19. (Original) The system of claim 18, wherein the dielectric gate comprises a hydrophobic patch adjacent one or more of the electrodes and configured to inhibit fluid flow from the inlet fluid pathway to the outlet fluid pathway in the absence of the electrical signals.

20. (Original) The system of claim 18, wherein the fluid reservoir comprises a pressurized reservoir.

21. (Previously Presented) The system of claim 18, further comprising an impedance sensor in operative relation to the dielectric gate and configured to count a number of droplets transferred from the inlet fluid pathway to the outlet fluid pathway.

22. (Original) The system of claim 18, wherein the system comprises a single chip.

23. (Original) The system of claim 18, wherein the fluidic device comprises a capillary electrophoresis device.

24. (Original) The system of claim 18, wherein the fluidic device comprises a polymerase chain reaction device.

25. (Original) The system of claim 18, wherein the fluidic device comprises a dielectrophoresis field flow fractionation device.

26. (Original) The system of claim 18, wherein the fluidic device comprises a programmable fluidic processor.

27. (Currently Amended) A method for fluid flow control, comprising:

flowing fluid from a fluid reservoir to an inlet fluid pathway;

applying ~~inhomogeneous~~ AC signals to one or more electrodes, resulting in inhomogeneous electrical fields, for drawing the fluid from the inlet fluid pathway to an outlet fluid pathway by dielectrophoretic forces arising from a dielectric gate;

flowing the fluid from the outlet fluid pathway to a fluidic device.

28. (Original) The method of claim 27, further comprising inhibiting the flow of fluid from the inlet fluid pathway to the outlet fluid pathway using a hydrophobic patch coupled to at least a portion of the dielectric gate.

29. (Original) The method of claim 27, further comprising counting a number of droplets transferred from the inlet fluid pathway to outlet fluid pathway using an impedance sensor in operative relation to the dielectric gate.

30. (Original) The method of claim 27, wherein flowing fluid from the fluid reservoir to the inlet fluid pathway comprises flowing the fluid through one or more virtual channels defined by hydrophilic or hydrophobic surface coatings, which provide preferential fluid flow directions.

31. (Original) The method of claim 27, wherein flowing the fluid from the outlet fluid pathway to the fluidic device comprises flowing the fluid through one or more virtual channels defined by hydrophilic or hydrophobic surface coatings, which provide preferential fluid flow directions.